WADE-8041

Mini-ITX Board

User's Manual

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Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your WADE-8041 system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get WADE-8041 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.portwell.com.tw/.

Chapter 1
System Overview

1.1 Introduction

The WADE-8041 is a cost-effective Mini-ITX embedded board for applications that need low power consumption. Built with Ultra Low Voltage Intel Celeron M processors, WADE-8041 generates the computing power necessary for most embedded applications. Its dual video feature also enables the use of two displays simultaneously. Its four COM and Six USB ports provide an immediate interface to a range of peripherals.

WADE-8041 can run with Intel Socket 479 Pentium M / Celeron M processors, and support DIMM up to 1GB DDR Memory. The enhanced on-board two PCI-IDE interface can support 4 drives with Ultra ATA33/66/100/133 synchronous mode feature, the on-board Super I/O chipset support four serial ports. Three RS-232 serial port interface and one RS-232 pin herder. Besides, it can provide dual display function by VGA and LVDS interface.

WADE-8041 can support up to two PCI add-on card via riser card. One 6-pin Mini-DIN connectors are provided to connect PS/2 mouse and keyboard. The on-board Flash ROM is used to make the BIOS update easier. One 20-pin standard connector is designed to support ATX power function. All of these features make WADE-8041 Series excellent in stand-alone applications.

1.2 Check List

The WADE-8041 package should cover the following basic items

- ✓ One WADE-8041 Mini ITX Board
- ✓ One 40pin IDE cable
- ✓ One Parallel Port cable
- ✓ One I/O Shield
- ✓ One Installation Resources CD-Title

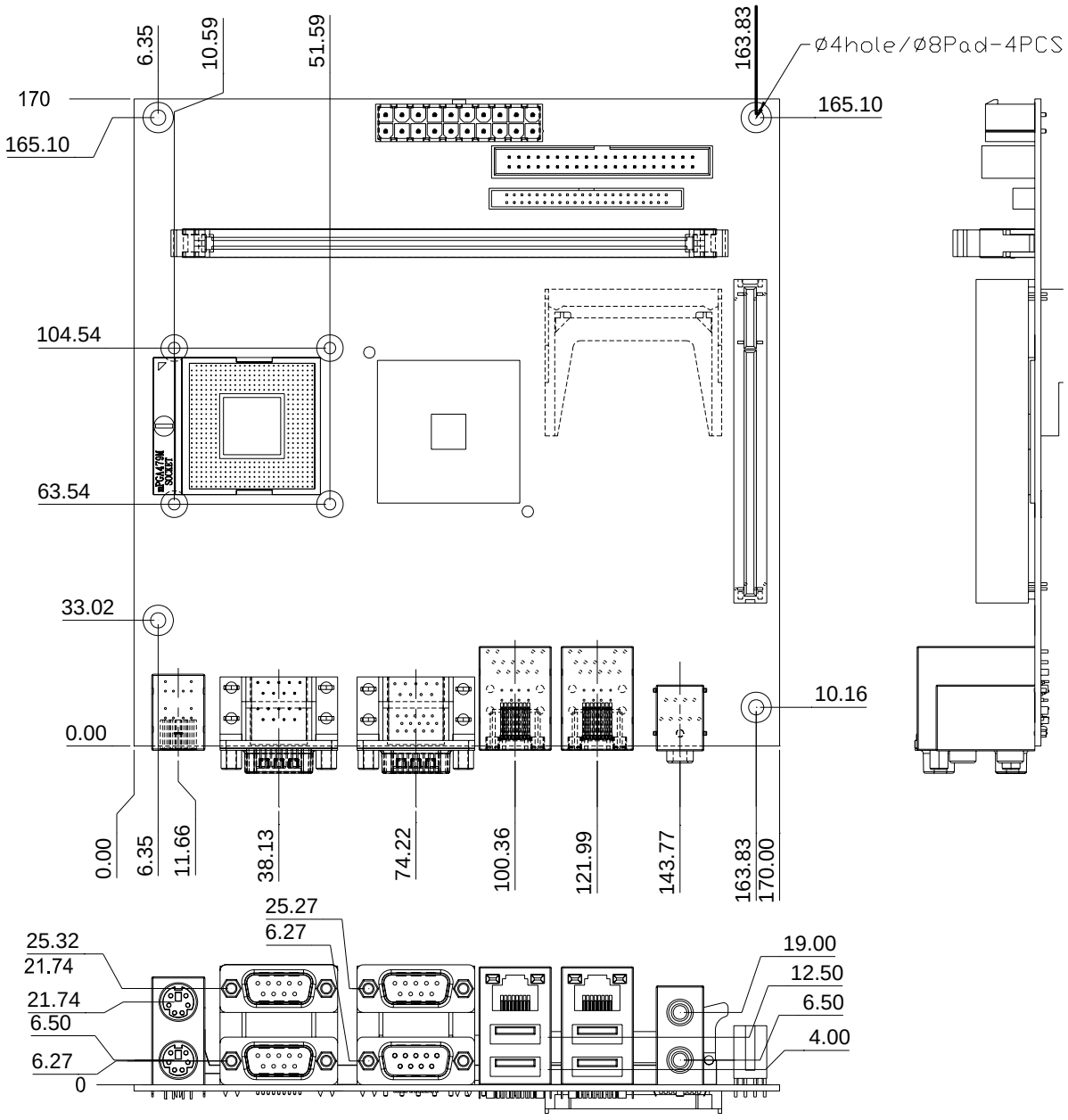
If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **CPU**
  - Support Intel Pentium Mobile / Celeron M processor
  - CPU bus clock : 400 MHz
- **Chipset Intel® 82852GM GMCH & 82801DB ICH4 Main Memory**
  - One 184-pin DIMM socket
  - Supports up to CL2 or 2.5 or 1 DIMMs at DDR200/DDR266 MHz memory bus.
- **System BIOS**
  AWARD BIOS
- **Super I/O Winboand W83627HG**
  - Serial Ports : Support Four RS232 ports
  - IrDA Interface : Support one Infrared port
- **Storage IDE Interface**
  Support Two Ultra DMA 33/66/100/133 support four IDE devices by one 44-pin and one 40-pin IDE connector, one Compact Flash socket (reverse side)
- **USB**
  Support 6 x USB 2.0 ports
- **Keyboard and PS/2 Mouse Interfaces**
  Support two mini-DIN 6-pin connectors for Keyboard and Mouse
- **Auxiliary I/O**
  - One 2-pin system reset switch
  - One 2-pin system power on LED
  - One 2-pin HDD active indicator interface
  - One 2-pin ATX power control interface
  - Two 3-pin headers for CPU and system fan
- **Real-Time Clock/Calendar (RTC)**
  - Build-in ICH4
  - Y2K compliant
- **System Monitoring and Protection**
  Monitoring system temperature, voltage, and cooling fan status
- **Wake On LAN**
  Support system wake up function from Network
- **On-chip VGA Display**
  - Intel® FW82852GM GMCH integrated Extreme Graphics controller
  - One DSUB-15 connector for CRT display interface
  - LVDS connectors for up to 24bits LVDS panel display interface
  - CRT mode: Support Maximum resolution up to 2048 x 1536
  - Multiple Maximum overlay display resolution up to 1600 x 1200

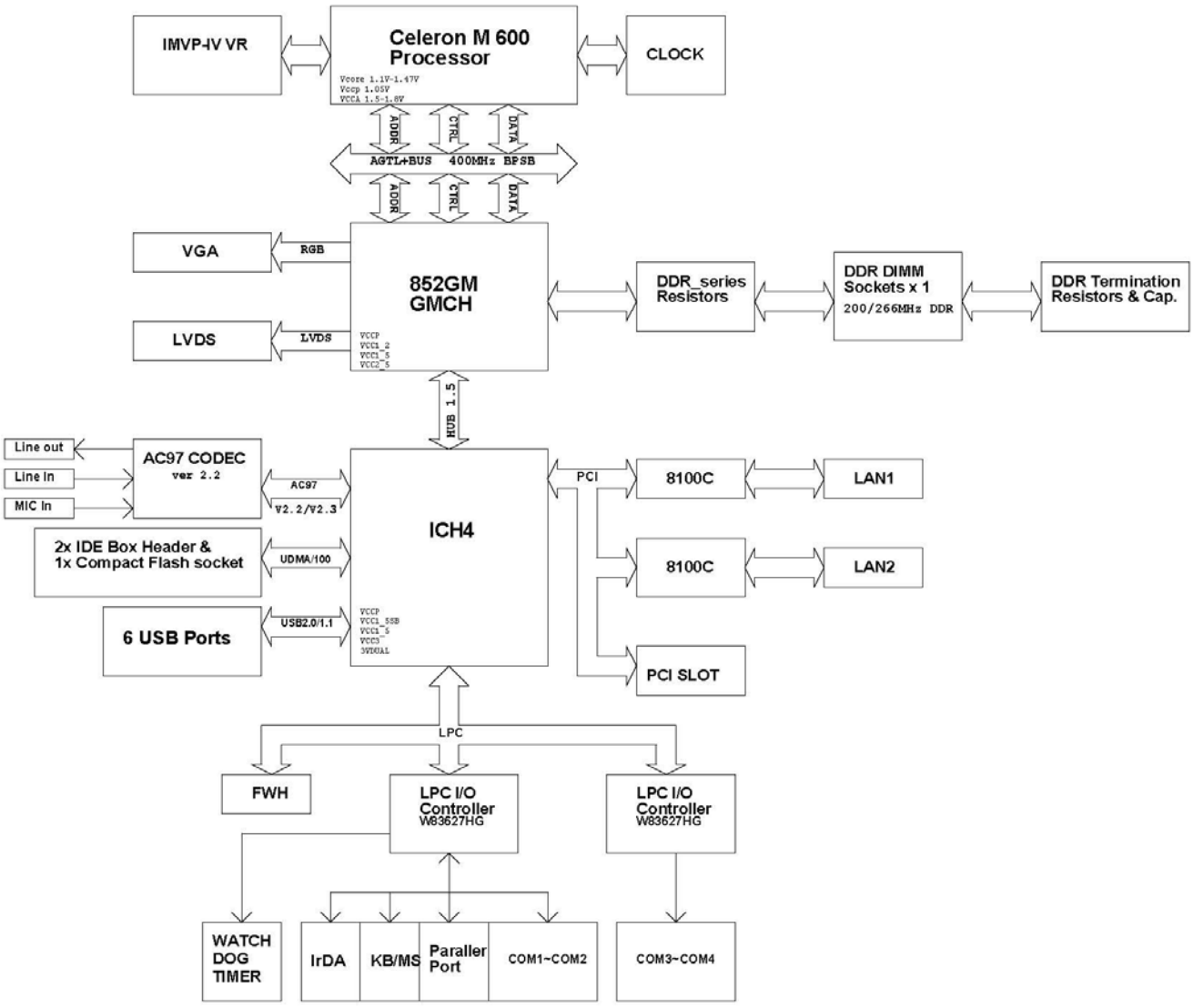
- **On-board Ethernet Function**
  - Support dual Ethernet function two RJ-45 interface ports, by Realtek (8100C) Ethernet controller support 10/100BASE-T
  - Support two LED indicators to display active and link message
- **PCI Interfaces**
  Support up to two PCI slot via riser card
- **Physical and Environmental requirements :**
  - Outline Dimension (L x W) : 170mm (6.69 inch) X 170mm (6.69 inch)
  - Power Requirements: +5V@1.3A (System), +12V@0.3A(CPU), +3.3V@0.7A(System)
  - Operating Temperature : 0 ~ 55 ℃
  - Storage Temperature : -20~70℃
  - Relative Humidity : 5% to 95%, non-condensing

1.3.1 Mechanical Drawing



1.4 System Architecture

All of details operating relations are shown in WADE-8041 System Block Diagram.



WADE-8041 System Block Diagram

Chapter 2
Hardware Configuration

This chapter indicates jumpers', headers' and connectors' locations. Users may find useful information related to hardware settings in this chapter. The default settings are indicated with a star sign (★).

2.1 Jumper Setting

For users to customize WADE-8041's features. In the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 2-1 for the Jumper allocations.

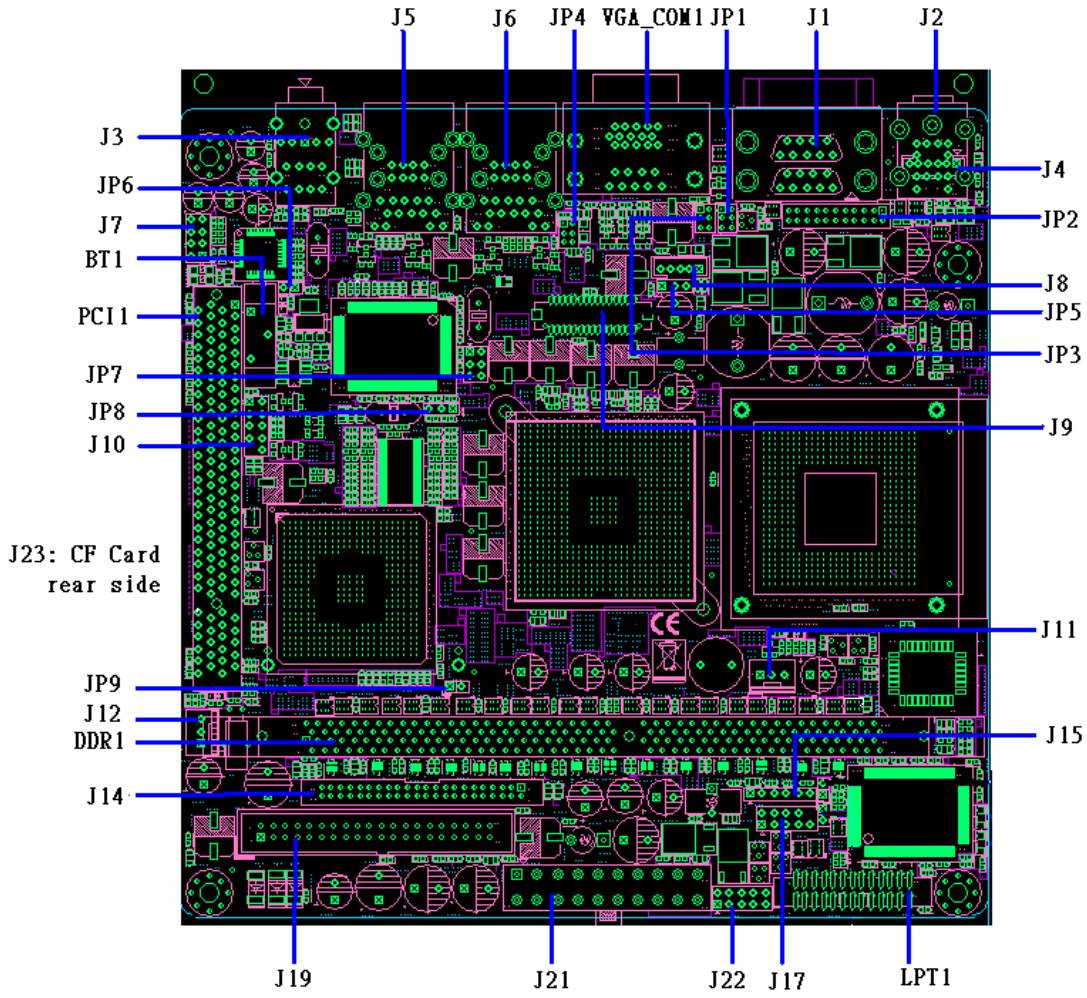


Figure 2-1 WADE-8041 Jumper and Connector Locations

The jumper settings are listed as follows:

JP1: COM2 RI/power function Selection

JP1	Function
1-2 SHORT	COM2_5V
3-4 SHORT	R2_1 ★
5-6 SHORT	COM2_12V

JP2: COM2 RS232/RS422/RS485 Function Select

PIN No.							Function
5-6	9-11	10-12	15-17	16-18	Other		
Short	Short	Short	Short	Short	Open		RS-232 ★
3-4	7-9	8-10	13-15	14-16	21-22	Other	
Short	Short	Short	Short	Short	Short	Open	RS-422
1-2	7-9	8-10	19-20	Other			
Short	Short	Short	Short	Open			RS-485

JP3: COM1 RI/power function Selection

JP3	Function
1-2 SHORT	COM1_5V
3-4 SHORT	RI_1 ★
5-6 SHORT	COM1_12V

JP4: COM3 RI/power function Selection

JP4	Function
1-2 SHORT	COM3_5V
3-4 SHORT	R3_1 ★
5-6 SHORT	COM3_12V

JP5: LCD Voltage Setup

PIN No.		Function
1-2	2-3	Panel power
Short	Open	+3V TFT LCD ★
Open	Short	+5V TFT LCD

JP6: CMOS Setup (1*2 Pin Header)

PIN 1-2	Function
Short	CLEAR CMOS
Open	Normal (Keep CMOS Setup)

JP7: PSB CLOCK

PIN No.			Description (MHz)		
(1-2)	**(2-3)**	**(5-6)**	**FSB**	**DDR SDRAM**	**GRAPHIC**
Open	**Open**	**Open**	400	267	133-200
Open	**Open**	**Short**	400	200	100-200
Open	**Short**	**Open**	400	200	100-133
Open	**Short**	**Short**	400	267	133-267
Short	**Open**	**Open**	533	267	133-200
Short	**Open**	**Short**	533	267	133-267
Short	**Short**	**Open**	533	333	167-267
Short	**Short**	**Short**	400	333	167-250

JP8: CPU FSB Setup

PIN No.		Description
1-2	**2-3**	FSB
Short	**Open**	Reserved (533MHz)
Open	**Short**	400MHz ★

JP9: CF Boot Setup

JP9	Function
SHORT	Master ★
OPEN	Slave

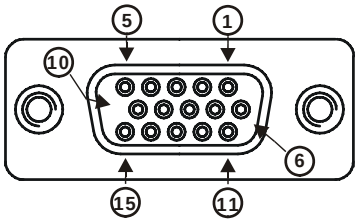
2.2 Connector Allocation

I/O peripheral devices are connected to the interface connectors

Connector Function List

Connector	Function	Remark
J1	COM1~COM2 (RS-232) connector	
J2	PS/2 Keyboard/Mouse connector	
J3	Audio Jack	
J4	KB/MS Pin header (OPTIONAL)	
J5A	10/100 LAN1 Connector	
J6A	10/100 LAN2 Connector	
J5B	USB (0~1) Connector	
J6B	USB (2~3) Connector	
J7	System Panel Power Button Connectors	
J8	Inverter Power Connector	
J9	Dual Channel LVDS Connector	
J10	USB (4~5) Connector	
J11	FAN1 Connector	
J12	FAN2 Connector	
J14	IDE 2 Interface Connector	
J15	IrDA Connector	
J17	COM4 (RS-232)	
J19	IDE 1 Connector	
J21	ATX Power Connector	
J22	GPIO Connector	
J23	Compact Flash Socket	
VGA_COM1A	CRT Connector	
VGA_COMB	COM3 (RS-232)	
LPT1	Printer Port	
DIMM	184 PIN DDR1 DIMM	

VGA_COM1A: CRT Connector



PIN No.	Description	PIN No.	Description
1	R	12	SDA
2	G	15	SCL
3	B	7/8	GND
13	HSYNC	5/10	GND
14	VSYNC	9	VGA_VCC

VGA_COMB: COM3 (RS-232)

PIN No.	Description	PIN No.	Description
C1	-DCD	C6	-DSR
C2	RX	C7	-RTS
C3	TX	C8	-CTS
C4	-DTR	C9	RI3/COM3_VCC
C5	GND		

LPT1: Printer Port

PIN No.	Description	PIN No.	Description
1	-STB	2	AFD
3	PTD0	4	ERR
5	PTD1	6	INIT
7	PTD2	8	SLIN
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND
17	PTD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	GND

DIMM1: 184 PIN DDR1 DIMM

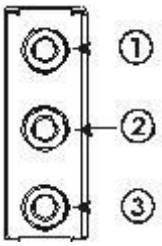
J1: COM1~COM2 (RS-232)

PIN No.	Description	PIN No.	Description
1	-NDCD	6	-NDSR
2	NRX	7	-NRTS
3	NTX	8	-NCTS
4	-NDTR	9	RI1/COM1_VCC
5	GND	10	DCD2
11	RXD2	13	DTR2
14	GND	15	DSR2
16	RTS2	17	CTS2
18	RI2/COM2_VCC		

J2: PS/2 Keyboard/Mouse

PIN No.	Description
1	K/B DATA
5	K/B CLK
3,9	GND
7	MDAT
4,10	+5V
11	MCLK

J3: Audio Jack



PIN No.	Description
1 (Blue)	Line In
2 (Lime)	Line Out
3 (Pink)	Mic In

J4: KB/MS Pin header (OPTIONAL)

PIN No.	Description
1	K/B DATA
2	MDAT
3	GND
4	+5V
5	K/B CLK
6	MCLK

J5A/J6A: 10/100 LAN Connector

PIN No.	Description	PIN No.	Description
1	CT	2	TX+
3	TX-	4	RX+
5	RX-	6	NC
7	NC	8	NC
9	NC	10	RXC

J5B: USB (0~1) Connector

PIN No.	Description	PIN No.	Description
1	+ 5V	5	+5V
2	USB_D0-	6	USB_D1-
3	USB_D0+	7	USB_D1+
4	GND	8	GND

J6B: USB (2~3) Connector

PIN No.	Description	PIN No.	Description
1	+ 5V	5	+5V
2	USB_D0-	6	USB_D1-
3	USB_D0+	7	USB_D1+
4	GND	8	GND

J7: System Panel Power Button Connectors (1*2 Pin Header)

PIN No.	Description
1	PW_BN+
2	PW_BN-
3	RESET SW+
4	RESET SW-
5	IDE LED+
6	IDE LED-
7	POWER LED+
8	POWER LED-

J8: Inverter Power Connector (1*5 Pin Wafer)

PIN No.	Description
1	BKL_EN
2	GND
3	+12V
4	GND
5	+5V

J9: Dual Channel LVDS Connector

PIN No.	Description	PIN No.	Description
1	VDD_CH1	2	VDD_CH1
3	CH1_IYAP0	4	CH1_IYAM0
5	CH1_IYAP1	6	CH1_IYAM1
7	CH1_IYAP2	8	CH1_IYAM2
9	CH1_IYAP3	10	CH1_IYAM3
11	CH1_ICLKAP	12	CH1_ICLKAM
13	CH1_DCPCLK	14	CH1_DCPDATA
15	GND_ CH1	16	GND_ CH1
17	CH2_IYBP0	18	CH2_IYBM0
19	CH2_IYBP1	20	CH2_IYBM1
21	CH2_IYBP2	22	CH2_IYBM2
23	CH2_IYBP3	24	CH2_IYBM3
25	CH2_ICLKBP	26	CH2_ICLKBM
27	CH2_DCPCLK	28	CH2_DCPDATA
29	GND_ CH2	30	GND_ CH2

J10: USB (4~5) Connector (2*5 pin Header)

PIN No.	Description	PIN No.	Description
1	+ 5V	2	+5V
3	USB_D5-	4	USB_D6+
5	USB_D5+	6	USB_D6-
7	GND	8	GND
9	NC	10	GND

J11/J12: FAN1 and FAN2 (1*3 Pin Box Header)

PIN No.	Description
1	Fan Speed Detect
2	+12V
3	GND

J14: IDE 2 Interface Connector (2*22 Pin Box Header)

PIN No.	Description	PIN No.	Description
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	IDRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	CHRDY	28	CABLE SELECT
29	DACK	30	GND
31	INT#	32	N/C
33	SA1	34	66DET
35	SA0	36	SA2
37	CS0#	38	CS1#
39	ACTIVE#	40	GND
41/42	+5V	43/44	GND

J15: IrDA Connector (1*6 Pin Wafer)

PIN No.	Description
1	+5V
2	Reserved
3	IRRx
4	GND
5	IRTx
6	NC

J17: COM4 (RS-232) (2*5 Pin Header)

PIN No.	Description	PIN No.	Description
1	-NDCD	6	-NDSR
2	NRX	7	-NRTS
3	NTX	8	-NCTS
4	-NDTR	9	-NRI_
5	GND	10	NC

J19: IDE 1 Connector (2*20 Pin Box Header)

PIN No.	Description	PIN No.	Description
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	CHRDY	28	CS
29	DACK	30	GND
31	INT#	32	N/C
33	SA1	34	66DET
35	SA0	36	SA2
37	CS0#	38	CS1#
39	ACTIVE#	40	GND

J21: ATX Power Connector

J22: GPIO Connector (2*5 Pin Header)

PIN No.	Description	PIN No.	Description
1	IO_4	2	IO_0
3	IO_5	4	IO_1
5	IO_6	6	IO_2
7	IO_7	8	IO_3
9	GND	10	+5V

J23: Compact Flash Socket

PIN No.	Description	PIN No.	Description
1	GND	26	N/C
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	CS0#	32	CS1
8	GND	33	GND
9	GND	34	IOR#
10	GND	35	IOW#
11	GND	36	VCC_COM
12	GND	37	IRQ15
13	+5V	38	+5V
14	GND	39	CSEL
15	GND	40	N/C
16	GND	41	RESET
17	GND	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	ACTIVE#
21	DATA 0	46	PDIAG#
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	N/C	50	GND

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® Pentium M/Celeron M Processor

Installing Socket 479 CPU on actuator (for PGA Processor Type)

Making sure to loosen the latch of actuator at correctly position (Open), and then configure CPU more gently, don't be forcible push to do it.

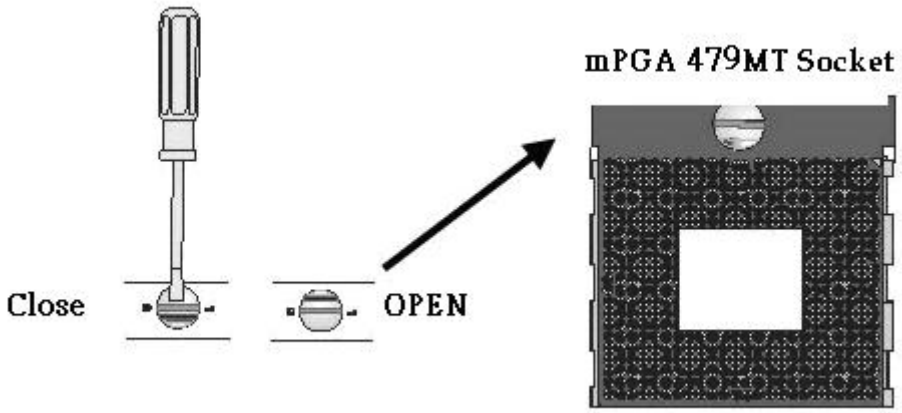


Figure 3-1

Removing CPU

1) Unlock the cooling fan first.
2) Unlock the latch of CPU socket to open position.
3) Carefully lifts up the existing CPU to remove it from the actuator.
4) Follow the steps of installing a CPU to change to another one or drive latch to close the opened actuator.

Configuring System Bus

WADE-8041 of PGA Type will automatically detect the CPU used. CPU speed of Intel Pentium M /Celeron M can be detected automatically.

3.2 Main Memory

WADE-8041 provides One DIMM socket which supports 200/266 DDR-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory size can be up to 1GB capacity.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be either one double-sided DIMM in either one DIMM socket or two single-sided DIMM in both sockets.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

3.3 Installing the Single Board Computer

To install your WADE-8041 into standard chassis or proprietary environment, please perform the following:

Step 1 : Checking all jumpers setting on proper position
Step 2 : Installing and configure CPU and memory module on right position
Step 3 : Placing WADE-8041 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.4 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

The chipset used on WADE-8041 is relatively new which operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows-2000/XP, please install its INF before any of other Drivers are installed.

3.3.2 Intel Integrated Graphics GMCH Chip

Using Intel 82852 GM chipset is the result of new design approach to optimize the shared memory architecture while maintaining the cost benefits of integration through Direct AGP and Dynamic Video Memory Technology. With no additional video adaptor, this onboard video provides the system display output.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI VGA card can take over the system display.

Drivers Support

Please find Springdale GMC driver in the WADE-8041 CD-title. Drivers support Windows-2000, Windows XP and Linux.

3.3.3 Ethernet Controller

Drivers Support

Please find Realtek 8100C LAN driver in /Ethernet directory of WADE-8041 CD-title. The drivers support Windows-2000 and Windows-XP.

LED Indicator (for LAN status)

WADE-8041 provides two LED indicators to report Realtek 8100C Ethernet interface status. Please refer to the table below as a quick reference guide.

8100C	Color	Name of LED	Operation of Ethernet Port	
			ON	OFF
Status LED	Green	LAN Linked & Active LED	Linked	Active (Blinking)
Speed LED	Green	LAN speed LED	100 Mbps	10 Mbps
			Green	Off

3.3.4 Audio Controller

Please find Realtek ALC655 Audio driver form WADE-8041 CD-title. The drivers support Windows 2000 and XP.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

JP6	Function
1-2 Short	Clear CMOS contents
Open	Normal Operation ★

To correctly operate CMOS Clear function, user must turn off the system, shorted JP6 jumper both of pin 1 and pin 2. To clear CMOS contents, please turn the power back on and turn it off again for AT system, or press the trigger a few times for ATX system. Removing the jump from JP6 to open and start the system.

3.5 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

WADE-8041 allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to Winbond W83627HG-AW data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of WDT.

```
//Step1. Enter W83627HG configuration registers mode:
outportb(0x2E, 0x87);
outportb(0x2E, 0x87);

//* Step2. Pin89 to be WDTO
outportb(0x2E, 0x2b);
outportb(0x2E + 1, 0x04);

//* Step3. Select logic device 8:
outportb(0x2E, 0x07);
outportb(0x2E + 1, 0x08);

//* Step4. Config WDT using second to be unit:
outportb(0x2E, 0xf5);
outportb(0x2E + 1, 0x00);

//* Step5. Set WDT time-out time:
outportb(0x2E, 0xf6);
outportb(0x2E + 1, time_out);

//* Step6. Exit configuration registers mode:
outportb(0x2E, 0xaa);
```

Watch dog timer fulfill under DOS Debug mode

(1) Example: Watch dog timer count down by "second"

```
o 2e,87
o 2e,87
o 2e,07
o 2f,08        ; select logic device 8
o 2e,30
o 2f,01        ; default active
o 2e,f5
o 2f,00        ; select timer by "second"
o 2e,f6
o 2f,14        ; Ex: timer=20 seconds; 00 = Watch dog timer time out disabled
```

(2) Example: Watch dog timer count down by "minutes"

```
o 2e,87
o 2e,87
o 2e,07
o 2f,08        ; select logic device 8
o 2e,30
o 2f,01        ; default active
o 2e,f5
o 2f,08        ; select timer by "minutes"
o 2e,f6
o 2f,05        ; Ex: timer=5 minutes; 00 = Watch dog timer time out disabled
```

3.6 GPIO

The WADE-8041 provides 8 programmable input or output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

3.6.1 Pin assignment

J22: General Purpose I/O Connector

PIN No.	Signal Description
1	General Purpose I/O Port 0 (W83627HG GP14)
2	General Purpose I/O Port 1 (W83627HG GP10)
3	General Purpose I/O Port 2 (W83627HG GP15)
4	General Purpose I/O Port 3 (W83627HG GP11)
5	General Purpose I/O Port 7 (W83627HG GP16)
6	General Purpose I/O Port 4 (W83627HG GP12)
7	General Purpose I/O Port 5 (W83627HG GP17)
8	General Purpose I/O Port 6 (W83627HG GP13)
9	Ground
10	+5V

All General Purpose I/O ports can only apply to standard TTL ± 5% signal level (0V/5V), and each source sink capacity up to 12mA.

3.6.2 WADE-8041 GPIO Programming Guide

There are 8 GPIO pins on WADE-8041. These GPIO pins are from SUPER I/O (W83627GH-AW) GPIO pins, and can be programmed as Input or Output direction.

J22 pin header is for 8 GPIO pins and its pin assignment as following :

J22_Pin1=GPIO4:from SUPER I/O_GPIO10 with Ext. 4.7K PH
J22_Pin2=GPIO0:from SUPER I/O_GPIO11 with Ext. 4.7K PH
J22_Pin3=GPIO5:from SUPER I/O_GPIO12 with Ext. 4.7K PH
J22_Pin4=GPIO1:from SUPER I/O_GPIO13 with Ext. 4.7K PH
J22_Pin5=GPIO6:from SUPER I/O_GPIO14 with Ext. 4.7K PH
J22_Pin6=GPIO2:from SUPER I/O_GPIO15 with Ext. 4.7K PH
J22_Pin7=GPIO7:from SUPER I/O_GPIO16 with Ext. 4.7K PH
J22_Pin8=GPIO3:from SUPER I/O_GPIO17 with Ext. 4.7K PH
<<<<< Be careful Pin9=GND , Pin10=VCC >>>>>

There are several Configuration Registers (CR) of W83627HG-AW needed to be programmed to control the GPIO direction, and status(GPI)/value(GPO). CR00h ~ CR2F are common (global) registers to all Logical Devices (LD) in W83627HG. CR07h contains the Logical Device Number that can be changed to access the LD as needed. LD7 contains the GPIO10~17 registers.

Programming Guide:

Step1: CR2A_Bit [7.2]. P [1,1,1,1,1,1]; to select multiplexed pins as GPIO10~17 pins
Step2: LD7_CR07h.P [07h]; Point to LD7
Step3: LD7_CR30h_Bit0.P1; Enable LD7
Step4: Select GPIO direction, Get Status or output value.

LD7_CRF0h; GPIO17 ~ 10 direction, 1 = input, 0 = output pin
LD7_CRF2h.P [00h]; Let CRF1 (GPIO data port) non-invert to prevent from confusion
LD7_CRF1h; GPIO17~10 data port, for input pin, get status from the related bit, for output pin, write value to the related bit.

For example,

LD7_CRF0h_Bit4.P0; Let GPIO14 as output pin
LD7_CRF2h_Bit4.P0; Let CRF1_Bit4 non-inverted
LD7_CRF1h_Bit4.P0; Output "0" to GPIO14 pin (J25_Pin6)

LD7_CRF0h_Bit0.P1; Let GPIO10 as input pin
LD7_CRF2h_Bit0.P0; Let CRF1_Bit0 non-inverted
Read LD7_CRF1h_Bit0; Read the status from GPIO10 pin (J25_Pin1)

How to access W83627HG CR?

In WADE-8041, the EFER = 002Eh, and EFDR = 002Fh.
EFER and EFDR are 2 IO ports needed to access W83627HG-AW CR.
EFER is the Index Port, EFDR is the Data Port.
CR index number needs to be written into EFER first,
Then the data will be read/written from/to EFDR.

To R/W W83627HG-AW CR, it is needed to Enter/Enable Configuration Mode first. When completing the programming, it is suggested to Exit/Disable Configuration Mode.

Enter Configuration Mode: Write 87h to IO port EFER twice.
Exit Configuration Mode: Write AAh to IO port EFER.

3.6.3 Example1

```
void enter_Superio2_CFG(void)
{
   outportb(0x2E, 0x87);
   outportb(0x2E, 0x87);
}


void exit_Superio2_CFG(void)
{
   outportb(0x2E, 0xAA);
}


void Set_CFG2(unsigned char Addr2,unsigned char Value2)
{
  unsigned char d2;
   outportb(0x2E, Addr2);
   delay(2);
   outportb(0x2E +1, Value2);
   delay(2);
}
```

```
unsigned char Get_CFG2(unsigned char Addr2)
{
  unsigned char d2;
    outportb(0x2E, Addr2);
    delay(2);
    d2 = inportb(0x2E +1);
    delay(2);
    return(d2);
}

int main(void)
{

    unsigned char d2;


    enter_Superio2_CFG();
    /* CR2A B7 = 1 selet GPIO Port 1*/
    d2 = Get_CFG2(0x2A);
    d2 = (d2 & 0x7F) | 0x80;
    Set_CFG2(0x2A, d2);

    /* IO test loop 1 */
    /* Set GPIO Port 1 of Superio 2 Enable */

    Set_CFG2(0x07, 0x07);    /* Select logic device 07 of Superio2*/
    Set_CFG2(0x30, 0x01);    /* Enable GPIO Port 1 of Superio2*/


    /* IO test loop 1 */

    /* Set GPIO Port 1 of Superio2 Enable */
    Set_CFG2(0x07, 0x07);    /* Select logic device 07*/
    Set_CFG2(0xF0, 0x0F);      /* GPIO Port 1 of Superio2 is [ooooiiii], o: output, i:input
*/
    Set_CFG2(0xF2, 0x00);      /* GPIO Port 1 of Superio2 is non-inversed*/


    Set_CFG2(0x07, 0x07);    /* Select logic device 07*/
    Set_CFG2(0xF1, 0xFF);    /* Initial back all GPIO Port1 of Superio 2 to hi */

    Set_CFG2(0x07, 0x07);    /* Select logic device 07*/
    Set_CFG2(0xF1, 0xEF);    /* GP14 of Superio2 -> ~GP10 of Superio2 */
    Set_CFG2(0x07, 0x07);    /* Select logic device 07 of Superio2*/
    d2 = Get_CFG2(0xF1);     /* get GPIO Port 2 data */
```

```
if (d2 == 0xEE )

  printf("\n GPIO14->10 test ok");
else
  printf("\n GPIO14->10 test fail ");
```

---

* Remarks

General Purpose Input/Output Interface (refer to J22)

a. Function description

IOGP10~IOGP17 belong to CMOS level Schmitt-trigger bi-directional pin with pull up resistor and open-drain output with 12mA sink capability.

b. Process

1. Setup function as GPIO Pin
2. Input Voltage to Input Port
3. Read Output Port value

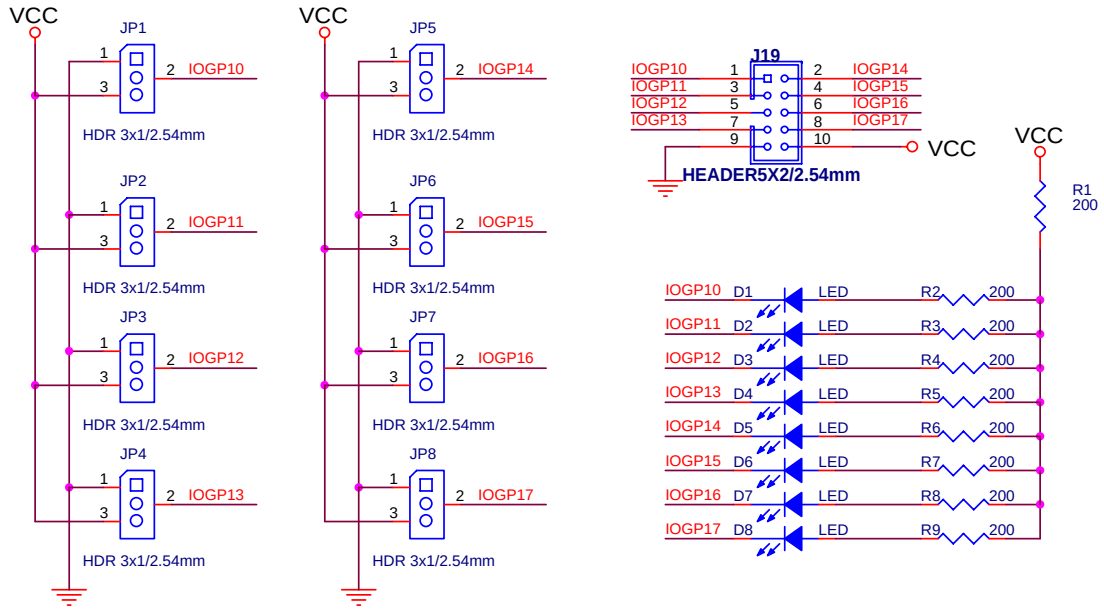
c. Example Program

Use "Turbo C" program Setup

```
#include <stdio.h>
#include <dos.h>

int main(void)
{
    int x,outdata,indata;
    printf("Now output data to GPIO Port ...");
    //  Enter the extended function mode
    outport(0x2e,0x87);
    outport(0x2e,0x87);
    //  GPIO multiplexed pin selection
    outport(0x2e,0x2a);
    outport(0x2f,0xff);                         //GP10 - GP14 enable

    //  Enable GPIO port1
    outport(0x2e,0x30);
    outport(0x2f,0xff);                         //Enable GPIO function


    //  Select the logical device
    outport(0x2e,0x07);
    outport(0x2f,0x07);                 // Device 7
```

```
        //  GP10 - GP17 I/O select
        printf("\nSet Port10 To Port17 input or output :");
        scanf("%x",&x);
        outport(0x2e,0xf0);
        printf("\n x= %x",x);
        outport(0x2f,x);                        //GP10 - GP17 output

        printf("\n Set output data :");
        scanf("%x",&x);
        //  set GP10-GP13 Output data
        outport(0x2e,0xf1);
        outport(0x2f,x);


        indata=inport(0x2f);
        printf("\n Get the Port input data =%x \n",indata);

        printf("Enter to test Port LED ....\n");
        getch();
        printf("LED test Now...");
        outdata=0x01;
        for (x=0;x<20;x++)
        {
         printf(".");
         outport(0x2e,0xf1);
         outport(0x2f,outdata);
         delay(300);
         outport(0x2e,0xf1);
         outdata=outdata<<1;
         if (outdata==0x10) outdata=0x01;
    }

    //Exit the extended function mode
    outport(0x2e,0xaa);


    return 0;
}
```

d. Example Schematics



e. Procedures

i) Run Program while show “Set Port10 To Port17 input or output:” Enter value: F0 (Setup IOGP10~ IOGP13 as output, IOGP14~ IOGP17 as input)

ii) JP5, JP6, JP7 Switch to VCC; JP8 Switch to GND; LED D8 will light on

iii) While show “Set output data:” Enter value: 7; LED D4 will light on. Then will show “Get the Port input data =77”

iv) While show “Enter to test Port LED”, press the “Enter” key; will light off the LED (from D5 to D8) 5 times by sequence.

Chapter 4
BIOS Setup Information

WADE-8041 is equipped with the AWARD BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8041 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

4.1 Entering Setup

Turn on or reboot the computer. When the message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try "COLD START" again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from "WARM START" by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

Press <F1> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

General Help	
↑ ↓ → ←	: Move
Enter	: Select
+ / - /PU /PD	: Value
ESC	: Exit
F1	: General Help
F2	: Item Help
F5	: Previous Values
F6	: Fail-Safe Defaults
F7	: Optimized Defaults
F9	: Menu in BIOS
F10	: Save

4.2 Main Menu

Once you enter WADE-8041 AWARD BIOS CMOS Setup Utility, a Main Menu is presented. The Main Menu allows user to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

Phoenix- AwardBIOS CMOS Setup Utility

▶ **Standard CMOS Features** ▶ **Advanced BIOS Features** ▶ **Advanced Chipset Features** ▶ **Integrated Peripherals** ▶ **Power Management Setup** ▶ **PnP/PCI Configurations** ▶ **PC Health Status**	▶ **Frequency/Voltage Control** **Load Fail-Safe Defaults** **Load Optimized Defaults** **Set Supervisor Password** **Set User Password** **Save & Exit Setup** **Exit Without Saving**
ESC : Quit F9 : Menu in BIOS F10 : Save & Exit Setup	↑↓→← : Select Item
Time, Date, Hard Disk Type …	

Note:
It is strongly recommended to reload Optimum Setting if CMOS is lost or BIOS is updated.

4.3 Standard CMOS Setup Menu

This setup page includes all the items in standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change **Date**, **Time**, **Drive type**, and **Boot Sector Virus Protection Status**.

Phoenix- AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Tur, April 10 2007	Item Help
Time (hh:mm:ss)	10 : 20 : 30	
▶ IDE Primary Master	[None]	Menu Level ▶
▶ IDE Primary Slave	[None]	
▶ IDE Secondary Master	[None]	Change the day, month, year and century
▶ IDE Secondary Slave	[None]	
Video	[EVG/VGA]	
Base Memory	640K	
Extended Memory	*252928K*	
Total Memory	*253952K*	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
Oblique parameters are base on memory capacity which user adopts on single board.

■ **Menu Selections**

Item	Options	Description
Date	mm:dd:yy	Change the day, month, year and century
Time	hh:mm:ss	Change the internal clock
IDE Primary Master	Options are in its sub menu (described in Table of section 4.4)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave		
IDE Secondary Master		
IDE Secondary Slave		
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Base Memory	640K	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

4.4 IDE Adaptors Setup Menu

The IDE adapters control the IDE devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive.

Phoenix- AwardBIOS CMOS Setup Utility
IDE Primary/Secondary Master (&Slave)

IDE HDD Auto-Detection	[Press Enter]	Item Help
IDE Channel 0 Master	[Auto]	
Access Mode	[Auto]	Menu Level ►
Capacity	*0 MB*	To atuo-detect the HDD's size, head … on this channel
Cylinder	*0*	
Head	*0*	
Precomp	*0*	
Landing Zone	*0*	
Sector	*0*	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
The oblique items are meaning base on what kind of storage device user employs.

■ **Menu Selections**

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary/ Secondary Master or Slave	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Access Mode	CHS, LBA Large, Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		
Cylinder	Min=0, Max=65535	Set the number of cylinders for hard disk
Head	Min=0, Max=255	Set the number of read/write heads

Precomp	Min=0, Max=65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min=0, Max=65535	****
Sector	Min=0, Max=255	Number of sectors per track

4.5 Advanced BIOS Features

This section allows user to configure your system for basic operation. The system's default speed, boot-up sequence, keyboard operation, shadowing and security may be modified accordingly.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced BIOS Features

▶ CPU Feature	[Press Enter]	Item Help
Virus Warning	[Disabled]	
CPU L1 & L2 Cache	[Enabled]	Menu Level ▶
Quick Power On Self Test	[Enabled]	
First Boot Device	[HDD-0]	
Second Boot Device	[CDROM]	
Third Boot Device	[LS120]	
Boot Other Device	[Enabled]	
Boot up NumLock Status	[On]	
Gate A20 Option	[Normal]	
Typematic Rate Setting	[Disabled]	
X Typematic Rate (Chars/Sec)	6	
X Typematic Delay (Msec)	250	
Security Option	[Setup]	
APIC Mode	[Enabled]	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non-OS2]	
Small Logo(EPA) Show	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Phoenix- AwardBIOS CMOS Setup Utility
CPU Feature

Thermal Management Thermal Monitor 1	Item Help
	Menu Level ▶ Set Limit CPUID MaxUal to 3, Should Be "Disabled" for WinXP
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults	

Virus Warning

Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU L1/L2 Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable cache
Disabled	Disable cache

Quick Power On Self Test

Allows the system skip certain tests while booting. This will decrease the time needed to boot the system.

Enabled	Enable quick POST
Disabled	Normal POST

First/Second/Third Boot Device

Select your Boot Device Priority.

The choice: Floppy, LS120, Hard Disk, CDROM, ZIP 100, USB-FDD, USB-ZIP, USB-CDROM, LAN and Disabled.

Boot Other Device

Select your Boot Device Priority.

The choice: Enabled, Disabled.

Boot Up Floppy Seek

Enabled tests floppy drives to determine whether they have 40 or 80 tracks.

The choice: Enabled, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Off, On.

Gate A20 Option

Fast-lets chipsets control Gate A20 and Normal – a pin in the keyboard controller controls Gate A20. Default is fast.

The choice: Normal, Fast.

Typematic Rate Setting

Keyboard repeat at a rate determined by the keyboard controller, when enabled, the typematic delay can de select.

The choice: Enabled, Disabled.

※Typematic Rate (Chars/sec)

The rate is which character repeats when you hold down a key at.

The choice: 6, 8, 10, 12, 15, 20, 24, and 30. (Default 6)

※Typematic delay (Msec)

The delay before keystrokes begin to repeat.

The choice: 250, 500, 750, and 1000. (Default 250)

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note:
To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

APIC Mode

The choice: Enabled, Disabled.

MPS Version Control For OS

The choice: 1.1, 1.4

OS Select For DRAM > 64MB

Select OS/2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

Small Logo (EPA) Show

Enabled	The EPA logo will appear during system boot-up.
Disabled	The EPA logo will not appear during system boot-up.

4.6 Advanced Chipset Features

This section allows user to configure the system based on the specific features of the Intel 82852GM GMCH and 82801DB ICH4 chipsets for WADE-8041. This chipset manages bus speeds and access to system memory resources, such as DRAM (DDR SDRAM) and the external cache. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for the system. The only time user might consider making any changes would be if you discovered that data was being lost while during system operation.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced Chipset Features

DRAM Timing Selection	[By SPD]	Item Help
X CAS latency Time	2.5	
X Active to Precharge Delay	7	Menu Level ►
X DRAM RAS# to CAS# Delay	3	
X DRAM RAS# Precharg	3	
DRAM Data Integrity Mode	Non-ECC	
System BIOS Cacheable	[Enabled]	
Video BIOS Cacheable	[Disabled]	
Memory Hole At 15M-16M	[Disabled]	
Delay transaction	[Enabled]	
Delay Prior to Thermal	[16 Min]	
AGP Aperture Size (MB)	[64]	
*** On-Chip VGA Setting ***		
On-Chip VGA	[Enabled]	
On-Chip Frame Buffer Size	[32MB]	
Boot Display	[CRT]	
Panel Scaling	[Auto]	
Panel Type	[640x480 18bit 1ch]	
FWH Write Protection	[Enabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

DRAM Timing Selection

The choice: By SPD, Manual.

System BIOS Cacheable

The choice: Enabled, Disabled.

Video BIOS Cacheable

The choice: Enabled, Disabled.

Memory Hole At 15M-16M

The choice: Enabled, Disabled.

Delay Transaction

The choice: Enabled, Disabled.

Delay Prior to Thermal

The choice: 4 Min, 8 Min, 16 Min, 32 Min.

AGP Aperture Size (MB)

The choice: 4, 8, 16, 32, 64, 128, 256

On Chip VGA

The choice: Enabled, Disabled.

On Chip Frame Buffer Size

The choice: 1 MB, 4 MB, 8 MB, 16 MB, 32 MB.

Boot Display

The choice: CRT, LVDS, CRT+LVDS, DVI, CRT+DVI.

Panel Scaling

The choice: Auto, On, OFF.

Panel Type

The choice: 640x480 18bit 1ch, 800x600 18bit 1ch, 1027x768 18bit 1ch, 1400x1050 18bit 2ch

FWH Write Protection

The choice: Enabled, Disabled.

4.7 Integrated Peripherals

Phoenix- AwardBIOS CMOS Setup Utility
Integrated Peripherals

▶ OnChip IDE Device	[Press Enter]	Item Help
▶ Onboard Device	[Press Enter]	
▶ Super IO Device	[Press Enter]	Menu Level ▶
Watch Dog Timer Select	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Phoenix- AwardBIOS CMOS Setup Utility
OnChip IDE Device

On-Chip Primary PCI IDE	[Enabled]	Item Help
IDE Primary Master PIO	[Auto]	
IDE Primary Slave PIO	[Auto]	Menu Level ▶
IDE Primary Master UDMA	[Auto]	
IDE Primary Slave UDMA	[Auto]	If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
On-Chip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Slave UDMA	[Auto]	
IDE HDD Block Mode	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

On-Chip Primary/Secondary PCI IDE

The choice: Enabled, Disabled

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields allow set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33/66/100 implementation is possible only if IDE hard drive supports and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and system software both support Ultra DMA/33/66/100, select Auto to enable BIOS support.

The choice: Auto, Disabled.

IDE HDD Block Mode

If IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled.

Onboard Device

Phoenix- AwardBIOS CMOS Setup Utility
OnBoard Device

USB Controller	[Enabled]	Item Help
USB 2.0 Controller	[Enabled]	
USB Keyboard Support	[Enabled]	Menu Level ►
USB Mouse Support	[Disable]	
AC97 Audio	[Auto]	
Init Display First	[PCI Slot]	
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

USB and USB 2.0 Controller

[Enabled] or [Disabled] universal host controller interface for universal serial bus.

The choice: Enabled, Disabled.

USB Keyboard/Mouse Support

Legacy support of USB keyboard or mouse.

The choice: Disabled, Enabled.

SuperIO Device Setting

Phoenix- AwardBIOS CMOS Setup Utility
SuperIO Device

Onboard Serial Port 1	[3F8/IRQ4]	Item Help
Onboard Serial Port 2	[2F8/IRQ3]	
UART Mode Select	[Normal]	Menu Level ▶
X RxD, TxD Active	Hi, Lo	
X IR Transmission Delay	Enabled	
X UR2 Duplex Mode	Half	
X Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	[378/IRQ7]	
Parallel Port Mode	[SPP]	
X EPP Mode Select	EPP 1.7	
X ECP Mode Use DMA	3	
PWRON after PWR-Fail	[Off]	
Onboard Serial Port 3	[3E8]	
Serial Port Use IRQ	[IRQ10]	
Onboard Serial Port 4	[2E8]	
Serial Port Use IRQ	[IRQ11]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

UART Mode Select

The choice: IrDA, ASKIR, Normal.

Parallel Port Mode

The choice: SPP, EPP, ECP, ECP+EPP, Normal.

PWRON After PWR-Fail

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

On	System automatically restores Power back
Off	System stays at Power-Off

Watch Dog Timer Select

The choice: Disabled, 10/20/30/40 sec, 1/2/4 Min.

4.8 Power Management Setup

The Power Management Setup allows configuration of the system to most effectively save energy while operating in a manner consistent with your own style of computer use.

Phoenix- AwardBIOS CMOS Setup Utility
Power Management Setup

ACPI Function	[Enabled]	Item Help
ACPI Suspend Type	[S3(STR)]	
X Run VGABIOS if S3 Resume	No	Menu Level ▶
Power Management	[User Define]	
Video Off Method	[DPMS]	
Video Off In Suspend	[Yes]	
Suspend Type	[Stop Grant]	
Suspend Mode	[Disabled]	
HDD Power Down	[Disabled]	
Soft-Off by PWR-BTTN	[Instant-Off]	
CPU THRM-Throttling	[50.0%]	
Wake-Up by Onboard LAN	[Enabled]	
Power On by Ring	[Enabled]	
X USB KB Wake-UP From S3	Disabled	
Resume by Alarm	[Disabled]	
X Date(of Month) Alarm	0	
X Time(hh:mm:ss) Alarm	0 : 0 :0	
** Reload Global Timer Events **		
Primary IDE 0	[Disabled]	
Primary IDE 1	[Disabled]	
Secondary IDE 0	[Disabled]	
Secondary IDE 1	[Disabled]	
FDD,COM,LPT Port	[Disabled]	
PCI PIRQ[A-D]#	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

ACPI Suspend Type

To decide which ACPI suspend mode to use.

The choice: S3 (STR) only.

※Run VGA BIOS if S3 Resume

The choice: Auto, Yes, No. (Default No)

Power Management

This category allows selecting the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

There are three selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 Min., and HDD Power Down = 1 Min.
User Defined	Allows you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 Hour and HDD Power Down ranges from 1 Min. to 15 Min.

Video off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This allows user to enable/disable video off in Suspend Mode.

The choice: Yes, No.

Suspend Type

Two options are available : Stop Grant and PWROn Suspend.

The choice: Stop Grant, PWROn Suspend.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

The choice: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choice: Disabled, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15 Min.

Soft-Off by PWR-BTTN

This item allows users to set the time to remove the power after the power button is pressed.

The choice: Instant-Off, Delay 4 Sec.

CPU THRM-Throttling

The choice: 87.5%, 75.5%, 62.5%, 50.0%, 37.5%, 25.0%, 12.5%.

Wake-Up By Onboard LAN

The choice: Disabled, Enabled.

Power On by Ring

When select "Enabled", a system that is at soft-off mode will be alert to Wake-On-Modem or Wake-On LAN.

The choice: Enabled, Disabled.

※USB KB Wake-Up From S3

The choice: Enabled, Disabled. (Default Disabled)

Resume by Alarm

This item allows users to enable/disable the resume by alarm function. When "Enabled" is selected, system using ATX power supply could be powered on if a customized time and day is approached.

The choice: Enabled, Disabled.

※Date(of Month) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the system.

The choice: 0 ~ 31.

※Time (hh:mm:ss) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the system.

The choice: hh (0~23), mm (0~59), ss (0 ~59).

Primary/Secondary IDE 0/1

This item is to configure IDE devices being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

FDD, COM, LPT Port

This item is to configure floppy device, COM ports, and parallel port being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

PCI PIRQ[A-D]#

This option can be used to detect PCI device activities. If they are activities, the system will go into sleep mode.

The choice: Enabled, Disabled.

4.9 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**eripheral **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix- AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

Reset Configuration Data	[Disabled]	Item Help
Resources Controlled By	[Auto(ESCD)]	
X IRQ Resources	Press Enter	Menu Level ►
PCI/VGA Palette Snoop	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Reset Configuration Data

Default is disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.

The choice: Enabled, Disabled.

Resource Controlled By

BIOS can automatically configure the entire boot and plug and play compatible devices. If set to Auto, IRQ DMA and memory base address fields can not be selected, since BIOS automatically assigns them.

The choice: Auto (ESCD), Manual.

※IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

The choice: Press Enter.
IRQ-3/IRQ-4/IRQ-5/IRQ-7/IRQ-9/IRQ-10/IRQ-11/IRQ-12/IRQ-14/IRQ-15 assigned to.

The choice: PCI/ISA PnP, Legacy ISA.

4.10 PC Health Status

Phoenix- AwardBIOS CMOS Setup Utility
PC Health Status

CPU Warning Temperature	[Disabled]	Item Help
Current System Temperature	*31℃/87℉*	
Current CPU temperature	*25℃/77℉*	Menu Level ▶
Current CPU Fan Speed	*RPM*	
Current System FAN Speed	*RPM*	
Vcore	*1.24 V*	
Vtt	*1.20 V*	
3.3 V	*3.36 V*	
+ 5 V	*5.18 V*	
+12 V	*12.34 V*	
VBAT(V)	*3.47 V*	
5VSB(V)	*5.11 V*	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
The oblique items are variable parameters which are base on power resource.

4.11 Frequency/Voltage Control

Phoenix- AwardBIOS CMOS Setup Utility
Frequency / Voltage Control

Auto Detect PCI Clk	[Enabled]	Item Help
Spread Spectrum	[Disabled]	
		Menu Level ▶

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Auto Detect PCI Clk

The choice: Enabled, Disabled.

Spread Spectrum

This item allows user to enable/disable the spread spectrum modulate.

The choice: Enabled, Disabled.

4.12 Default Menu

Selecting "Defaults" from the main menu shows two options which are described below,

Load Fail-Safe Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4.13 Supervisor/User Password Setting

Either supervisor or user password can be setup, or both of then. The differences between are:

Set Supervisor Password : can enter and change the options of the setup menus.

Set User Password : just can only enter but do not have the right to change the options of the setup menus. When selecting this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will reboot and Setup can be entered freely.

PASSWORD DISABLED

When a password has been enabled, user will be prompted to enter it every time user tries to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of the computer.

User may determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.14 Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after system off. During subsequnet booting of computer, the BIOS configures the system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

This allows user to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get WADE-8041 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

Intel Socket 479 Pentium M / Celeron M processor

Please kindly refer the figure 3-1 at chapter 3, user has to configure CPU into the actuator more gentle and locks the latch on the actuator, don't forcible push CPU into socket.

5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 184-pin DDR SDRAM, keyboard, mouse, floppy drive, IDE hard disk, VGA connector, device cables, ATX power cable are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8041, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/ COM2/COM3/COM4 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1/COM4 serial port to release IRQ #4
Disable COM2/COM3 serial port to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System timer
IRQ #1	Keyboard
IRQ #2	cascade
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	PCI device
IRQ #6	PCI device
IRQ #7	Possibility used by LPT1
IRQ #8	RTC clock
IRQ #9	PCI device
IRQ #10	COM3
IRQ #11	COM4
IRQ #12	Mouse
IRQ #13	Mathprocessor : 686
IRQ #14	Fixed disk
IRQ #15	Probably not available

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Symptom: SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Information & Support

Question:Why cannot I install USB 2.0 driver?

Answer: If you are using Windows 2000, you need to update your Service-Pack version to Service-Pack 4. If you are using Windows XP, you need to update Service-Pack to Service Pack 1 at least.

If you cannot find BIOS that you need, please contact with Technical Support Department to request a new BIOS to solve this problem.
Technical Support Department
Mailto: tsd@portwell.com.tw

Question:I forget my password of system BIOS, what am I supposed to do?

Answer: You can simply short 1-2 pins on JP6 to clean your password.

Note:
Please visit our technical web site at
http://www.portwell.com.tw
For additional technical information, which is not covered in this manual.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000 – 003F	1K	Interrupt Area
0040 – 004F	0.3K	BIOS Data area
0050 – 006F	0.5K	System Data
0070 – 0BE3	45K	DOS
0BE4 – 0E1B	8.9K	Program Area
0E1C – 9E26	576K	Available
9E27 – 9FBF	6.4K	Program Area
= Conventional memory ends at 640K =		
9FC0 – 9FFF	1K	Extended Bios Area
A000-AFFF	64 K	VGA Graphics
B000 – B7FF	32 K	Unused
B800 - BFFF	32 K	VGA Text
C000 – CC7F	50 K	Video rom
CC8F –DFFF	78 K	unused
E000 -FFFF	128 K	System ROM
HMA	64 K	First 64K extended

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System timer
IRQ 1	System ROM	Keyboard
IRQ 2	[Unassigned]	cascade
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	[Unassigned]	PCI device
IRQ 6	System ROM	PCI device
IRQ 7	[Unassigned]	Possibility used by LPT1
IRQ 8	System ROM	RTC clock
IRQ 9	[Unassigned]	PCI device
IRQ 10	[Unassigned]	COM3
IRQ 11	[Unassigned]	COM4
IRQ 12	System ROM	Mouse
IRQ 13	System ROM	Mathprocessor:686
IRQ 14	System ROM	Fixed disk
IRQ 15	[Unassigned]	Probably not available